In this issue

Anemophily, seed dispersal and seedling ecology of *Cycas sphaerica*

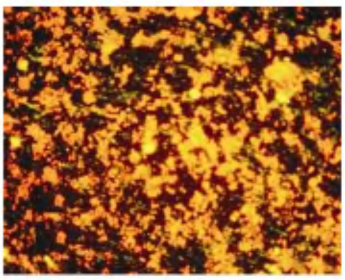
Cycas sphaerica is a data-deficient red-listed species confined to northern Eastern Ghats of India. It reproduces asexually and sexually. In asexual mode, bulbil mode of reproduction is functional. In sexual mode, a small number of plants participate in the coning event during March–May. The plant is typically anemophilous and effective for optimal seed set. The cones of both sexes show strong thermogenesis and odour production during maturation process; these two processes attract *Derelomus* weevils which use male cones for feeding and breeding during which they get covered with pollen. These weevils in search of other male cones also visit female cones and effect pollination accidentally. The female cones offer only warmth to the weevils during night. The weevils diapause on male plants until the next coning season. Spotted deer, sloth bear and rainwater disperse seeds. Seeds are not dormant. Natural regeneration through sexual and asexual means is poor, which could be due to seed predation, inability of the germinating seeds and growing seedlings to compete well with the seasonal plants and grasses for the available nutrients in the soil and litter, and erratic rainfall or dry spells within the rainy season. The traditional uses of this species are also decimating its population size. Our field studies show that the locals collect its feathery leaves especially from young plants for selling them in the local florist markets. The leaves are used for making bouquets. The tender leaves are used for making vegetable curry. Young stems are cut to remove pithy material for food preparation. Male cones are collected for use as a repellent against mosquito bites. These various uses are a great threat to the very survival of the species in the course of time. Recent preliminary survey activities by different agencies at the area of *C. sphaerica* indicate that it is a rich low-grade granite reserve and hence mining activity for granite is most likely. If this happens, the plant may soon vanish. Therefore, Raju *et al.* (**page 1105**) suggest that effective measures are urgently required for the protection of the area from any encroachment and for the restoration and stabilization of population size of this species.

Variations in soil organic carbon and litter decomposition

Tropical forest soils act as a sink for carbon. Yet it remains unclear whether the tropical forest soils can act continuously as a sink for carbon or going to reach a steady state. Lack of a clear understanding about different pools of soil organic carbon (SOC), along with their chemical nature and quantity makes it difficult to know about the sink potential of soils in tropics. Dinakaran and Krishnayya (**page 1051**) measured the SOC content at different depths in three different vegetal covers up to 1.25 m depth. They suggest that tropical soils can hold more SOC and are yet to reach a steady state. Results of litter-bag experiment support this. Variations in SOC across different vegetal covers are largely restricted to the kind of inputs the top layers receive after the decomposition of freshly fallen litter. There is a decrease in the SOC at deeper layers, but the proportion of the recalcitrant pool almost remained the same. Uniformity seen in the chemical composition of SOC coming from proton NMR study revealed that barring initial steps, decomposition of organic matter would follow more or less the same path in tropical soils, irrespective of differences in plant litter. The study opens up new vistas of understanding for the processes happening in the SOC movement across tropics. It also gives better inputs/values for developing models across tropics of similar climatic conditions.

Antibacterial properties of condenser materials

Biofouling is one of the major problems faced by condenser materials of power plants using seawater for cooling. In general, numerous studies have shown that no routine treatment regime can successfully keep the condenser tube clean over a period extending to years. Metal nanoparticles are known to exhibit enhanced physical and chemical properties when compared to their bulk counterparts because of their high surface to volume ratios. Metals like copper are very toxic to microorganisms and effectively kill most of the microbes by blocking the respiratory enzyme. Therasa *et al.* (**page 1079**) attempt to improve the antibacterial properties



of the condenser materials by surface modification of titanium. They show the electroless deposition of nano thin films of copper on titanium surface lead to effective control of biofilm formation. Surface characteristics of the films were studied by using GIXRD, SEM and AFM. Antibacterial properties of the surface were evaluated by exposure studies in seawater by using total viable count and epifluorescence microscopic techniques. Excellent antibacterial activity was exhibited by the electroless plated nano copper film on the titanium surface, showing more than two orders decrease in the bacterial density compared to titanium surface.